The Body, Its Emotions, the Self, and Consciousness

Graham W. Boyd

ABSTRACT This article proposes a means for better understanding the self and consciousness. Data indicate that the basic "emotional brain" continually computes potential survival risk against reward to rank consequent "emotion scores" for all sensory inputs. These scores compete to yield winner-takes-all outcomes that determine the choice of attention or action. This mechanism prevails regardless of whether the competing options gain their emotion scores through a rational or an intuitive pathway. There is no need to postulate any homunculus or inner self in control of such choice; indeed, our belief in a first-person self in overall control is wrong. The self is a passive construct arising from each individual's social development, where language acquisition vastly heightens communication and awareness not only outwardly, but also inwardly, as if to a controlling "inner I." However, when society comes to hold the maturing being accountable for his or her actions, the brain must respond, and it does so in the only way it can, by deeming that this passive, inner self-construct act as if it were the active self in charge. Consciousness emerges when the language-based output of the higher brain is referred for ownership to this artificial self-construct.

Recently I was trying to explain to an intelligent woman the problem of trying to understand how it is we perceive anything at all, and I was not having any success. She could not see why there was a problem. Finally in despair I asked her how she herself thought she saw the world. She replied that she probably had somewhere in her head something like a little television set. "So who," I asked "is looking at it?" She now saw the problem immediately.

—F. H. Crick (1979)

Department of Medicine, University of Western Australia, Nedlands, Australia.
Correspondence: 43 Kanimbla Road, Nedlands, WA 6009, Australia.
E-mail: graham.boyd@uwa.edu.au.

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OVER THE YEARS, I have come to the view that the brain, rather than the mind, makes all decisions, just as it has done throughout our evolutionary past. It does so unconsciously, and within that part of the brain representing the basic bodily emotions (the "emotional brain" (Dalgleish 2004). This emotional brain computes "values" (emotion scores) for each presenting option, based on the estimated degree of risk/reward or cost/benefit the option presents to the well-being of the organism. Although learned rational options and heuristic rules of thumb can also compete in this "winner-takes-all" process, they can succeed only if their emotion score values surpass those of their more intuitive risk/reward rivals.

This synthesis is in keeping with the emerging data on decision-making, particularly the studies of Kahneman (Kahneman 2002, 2011). It has the important corollary that if the brain, and not the mind, makes the decisions, then the so-called "hard problem" of the mind (Chalmers 1995) becomes a great deal easier: the brain is in charge of itself.

EMOTION SCORING OF SENSE DATA

The emotional brain incorporates all those aspects of the brain concerned with evaluating the basic emotions of reward and risk related to incoming sense data. At the lowest level, this includes the amygdala (fear and arousal) and the midbrain striatal system (risk/reward) . At higher levels, it incorporates the orbitofrontal cortex (OFC), the insula, the ventromedial prefrontal cortex, and the anterior cingulate cortex (ACC), as well as other areas (Campbell 2007; Dalgleish 2004; Landreth and Bickle 2008; Preuschoff, Quartz, and Bossaerts 2008; Rushworth et al. 2007; Sugrue, Corrado, and Newsome 2005). These higher brain regions are particularly important in the context of resolving choice ambiguity (Quartz 2009; Rushworth and Behrens 2008)

Below, I outline my reasons for taking this perspective. I will then go on to suggest that consciousness is indeed a secondary and delayed phenomenon, and that the self is a social construct. The mechanism suggested in the first part of the article allows the brain to be seen as autonomous without appealing to either the transcendental "givenness" of consciousness in the phenomenological perspective or the infinite regression of higher-order representation theories of consciousness philosophy (Drummond 2006; Moran 2005; Thompson 2011). Instead, the brain is seen as self-controlling, even at the highest level: there is no need for any homunculus, television set viewer, or other "controller."

Attention and Decision Making

Emerging data suggests that the basic emotional responses of the brain can automatically control attention and decision-making, at least of an "intuitive" kind. Life has evolved an increasingly sophisticated and unconscious mechanism for assessing the sensory input for potential threat or benefit to its survival or

well-being. This mechanism is located in the part of the brain that relates to the emotions. It converts the incoming sense data into a "common currency" for evaluation, puts it into context, and then ranks the resulting "relative subjective values" so as to allow disparate information to be compared (Glimcher 2009; Montague and Berns 2002; Park et al. 2011). This results in winner-takes-all outcomes. If no action is required, the highest score of the winner-takes-all "auction" determines what captures the brain's immediate attention. But if there is any hint of threat or benefit within the data, a process of "reward harvesting" or "threat evaluation" ensues to define the best option for action, with that sometimes being the best of a bad lot (Blair et al. 2006; Campbell 2007; LeDoux 1998; Montague and King-Casas 2007). This decision and choice mechanism is surprisingly precise, with reward and risk predictions being calculated quantitatively before optimal choices are made (Quartz 2009; Rushworth et al. 2007; Sugrue, Corrado, and Newsome 2005). In addition, any differences between predicted and actual rewards and risks are used in feedback reinforcement, so that the brain learns to improve subsequent predictions (Bayer and Glimcher 2005; Niv and Schoenbaum 2008; Oyama et al. 2010; Preuschoff, Quartz, and Bossaerts 2008). The literature concerning this process is now well advanced, and owes a great deal to neuroecomonics (Kable and Glimcher 2009; Landreth and Bickle 2008; Rushworth and Walton 2009). The fields of cognitive science and neuroscience have also been important, particularly in relation to evaluation and choice action under conditions of uncertainty (Montague and King-Casas 2007; Rushworth and Behrens 2008; Rushworth et al. 2007), but will not be discussed further here. Suffice it to say that there is now fairly uniform agreement that unconscious brain mechanisms are prominent in determining decision choice, at least at an intuitive level.

Details of Mechanism

Of course, operation of the evaluation and choice system must be more complex than outlined above. The following relatively small-print detail suggests how it all might work in a neural network kind of way—albeit still rather simplistically compared with the more mainstream literature in that field (Carpenter, Grossberg, and Rosen 1991; Grossberg 2000).

Sensory data are seen as being processed in parallel with the responses they evoke from the emotional brain system. By this view, ever-increasing levels of the emotional brain dynamically compute quantitative emotion scores to all sensory data on their way to optimal definition. At the lower emotional brain levels, for example in the amygdala's "alert/risk" and mid-brain striatal basic "reward" systems, data with scores below a minimum threshold are seen as being rejected, while any above the upper limit at any time capture the higher brain's immediate attention. Failing the latter, further emotion-scoring proceeds at higher emotional brain levels (e.g., OFC evaluation and ACC choice systems; Rushworth et al. 2007). These scores eventually compete at the highest emo-

tional brain level to yield winner-takes-all outcomes. In the case of usual sensory data inputs, that process determines what comes to the higher brain's immediate attention. Where some action is required, the evaluative process includes a quantitative computational risk-benefit analysis of the various options before the final choice is made.

The prevailing maximum and minimum thresholds outside which outputs lead to action and rejection respectively are seen as varying with time, being determined by, among other factors, motivational drives reflecting basic biological needs. If at any time none of the available options comes to exceed the set maximum, the system lowers that threshold to allow a brief focus on the best available, while at the same time reverting from attention to reorientation-and-search mode until a more suitable contender is found (Carpenter, Grossberg, and Rosen 1991; Grossberg 2000). Of course, at any time such a search may reveal a totally new item of interest, or otherwise some new motivational drive may replace the old, in which case the whole system is launched in a new direction.

Such analyses are held to apply to all levels of sensory processing, regardless of whether the input is derived from an external source, generated internally by reference to the various memory networks, or conditioned from above by a variation in higher-brain top-down context. The suggested minimum cut-off emotion score threshold ensures that the competition process is not impeded by the unnecessary inclusion of trivial data. Memory traces of remaining data, between the minimum and maximum thresholds, are seen as being retained for a time, allowing them to remain competitive with any new data arising from a switch of the system from attention to reorientation-and-search mode. Clearly, within this whole mechanism, only one winner-takes-all outcome can capture the focus of attention at any one time. Nonetheless, others above the current maximum emotion score threshold may evoke pre-attentive processing and action, this time subliminally, as when the hands steer automatically while the main focus is on the road.

The nature of the emotions involved in this process are decided by the emotion-scoring risk/reward system itself. This system could yield a score over a scale of, say, +100 to −100, depending on the degree of computed potential reward/punishment. Sometimes the outcome would entail accepting the lesser of two evils (Blair et al. 2006; Campbell 2007). Because the emotional brain is quite capable of learning dynamically (Bayer and Glimcher 2005), the whole emotion scoring process can become increasingly more sophisticated with the individual's positive and negative experiences over time.

In a sense, this system can be seen as a mechanism for registering basic pleasure or displeasure, learned or otherwise, but always with the proviso that these terms are restricted to their pre-attentive manifestations within the emotional brain. Social emotions such as joy or sadness are not viewed as being primarily involved here, at least not in their conscious manifestations (see further below).

Just what neural network mechanisms might implement such a process

remains undetermined. However, there are certainly good examples of successful winner-takes-all mechanisms in artificial neural networks, so the whole process is much more than a theoretical possibility (Carpenter, Grossberg, and Rosen 1991; Grossberg 2000).

THE EMOTIONAL BRAIN AND RATIONALITY

The reader may, of course, interject that this whole process is all very well for unconscious, almost reflex, survival mechanisms, but it does not really help explain the situation in humans, with our highly developed capacity for rational thought. However, the intuitive emotional brain is still likely to contribute in some way in humans. Damasio's (1994) somatic marker hypothesis holds that intuitive or emotional "gut feelings" act as a biasing device to reduce the number of options competing for rational consideration, rather like the pre-selection process for a competition final. But the evidence is now against this. Nobel laureate Daniel Kahneman and his colleagues have shown that there are indeed two systems involved in decision-making in man, equivalent to the intuitive and the rational (Kahneman 2002, 2011). Surprisingly, though, the intuitive system strongly dominates. De Neys and Glumicic (2008) have now found that this is not because of any lack of due (unconscious) deliberation over rational options, but because the rational options somehow do not carry enough "weight" to overcome the intuitive.

Kahneman's (2011) suggestion is that the two systems for decision-making work as follows. System 1 is automatic, intuitive and fast, even impulsive, while System 2 is deliberative, slow, rational, and controlled. However, I regard the intuitive process as being more in line with the views of Damasio (1994)—in other words, dominated by the emotional "gut feelings" that arise from the body's emotional brain. Also, Kahneman includes heuristic rules of thumb as an important part of intuitive system 1. This seems sound, not because of any intrinsic "emotional value" such rules of thumb possess within that system, but because experience over time soon gives them such values, and so allows them to compete with the more intuitively based emotion-scored options. Most importantly, the same can be said of rational options, where experience can serve precisely the same end. The problem there, however, is that rationality and logic are relative latecomers on the evolutionary stage, and correspondingly seem to have [problems] difficulty getting through to the emotional evaluation system to obtain competitive emotional scores. This is particularly the case with [statistical and probability arguments] probability and statistical problems (Kahneman 2011).

Option Weighting

To understand how rational options might be "weighted" against the intuitive to sometimes gain the upper hand, I suggest the following hypothesis:

Rational options are chosen if, and only if, the emotion scores they evoke from the evaluative risk/reward system of the emotional brain are high enough to out-compete their more intuitive rivals.

Rational options evoke those emotion scores by prevailing at times when little else appeals, by analogy with some previous experience, or when suggested by trusted or experienced others. As a simple example, when a child realizes from some previous experience that putting one box on top of another can allow her to reach a desirable but otherwise unobtainable piece of fruit, she might experience such reward, and with it the "feeling" of the great joy and pleasure in discovery. A successful option like this would then be given a correspondingly high emotion score, and no doubt be tucked away in the memory banks for use in some analogous situation in future. Much learning from experience might be involved in attaining such rational options and heuristic rules of thumb, but the present view holds that, in the end, they will only be useful in reaching decisions if they have enough "appeal" to the emotional brain system to outbid their more intuitive rivals. Put another way, whether we like it or not, we are disposed to choosing rational options only insofar as they are judged to be potentially more emotionally rewarding than their intuitive rivals—in essence, only if they "feel" better.

Relevant to this point, Damasio (1994) has demonstrated that damage to the ventro-medial prefrontal cortex can cause difficulty in making even simple decisions. This is interpreted here as being due to a problem of getting rational options or heuristic rules of thumb back down to the evaluation/reward system to obtain any sort of competitive emotion-score.

Of course, with time and experience within a social world, learned emotions—like shame on the one hand, or bravery on the other—may sometimes facilitate sufficiently high emotional scores to sway the decision. However, the important factor is what registers within the emotional brain, rather than in any conscious manifestation. Similarly, individual members of a highly organized society may allow some basic emotion-score predisposition to be overridden by societal mores or the respected views of others (Saxe and Haushofer 2008). But the final decision is still seen as being made within the emotion-scoring system described.

Coexistence and competition of the rational with the intuitive like this may seem odd, but it would explain De Ney and Glumicic's (2008) results, and it is also in keeping with Glimcher's (2009) findings that there is no apparent division of the brain areas into rational and emotional subgroups. So overall, "The emotional tail wags the rational dog" (Kahneman 2011, p. 140). In effect, the senses can be seen as merely providing the organism with a means of evaluating the environment with respect to the organism's well-being. By this synthesis, we humans are just like all other creatures: forever pre-attentively trawling the natural world for something that might satisfy our needs, and sometimes settling on

a rational option if it is analogous to something of previous appeal, while all the time remaining wary of any threat the environment might portend. The only difference between the present view and that of Kahneman is that here the intuitive or emotional system always prevails, notwithstanding that heuristics and rational options may emerge from it if they have sufficient emotional appeal.

If this much is accepted, at least as a possibility, then something very important follows in relation to the mind-body problem—namely, that this could be the mechanism we seek as the controller of higher-brain deliberations. In this model, the brain functions autonomously on the basis of the evaluation and choice mechanisms afforded it by the risk/reward system, perhaps more sophisticatedly in higher species, but always at an unconscious and essentially intuitive level. There is now no need to postulate some mysterious "ghost in the machine" as controller in charge, and the problem of "uncaused causes" pales into insignificance (Baumeister, Masicampo, and Vohs 2011; Ryle 1949). Attention and cognition are both determined by this evaluative risk/reward system.

Some readers may take exception to the model presented here. "Regardless of whether and how rational options feed into the evaluation/reward system for decision-making," they may object, "this is ultimately all sleight of hand. We are selves in overall conscious control of all we perceive, believe, think, intend and do, and can readily accept or veto any decision put forward from any such basic emotional brain level!" Well, in my view it's not that simple, and I will now consider possible ways that consciousness and an apparently controlling self may be explained in the light of the emotional brain.

Consciousness as a Late State of Brain Activity

It is not at all necessary to hold that we are active selves in conscious control. Consciousness is actually a latecomer on the stage of any individual's prevailing brain activity. In particular, it is now well established that consciousness of an urge to move at any one particular time is preceded by brain activity for at least half a second (Libet 1985). This controversial finding has been confirmed in many studies, most recently and most importantly using single neuron recordings within the human medial frontal cortex (Fried, Mukamel, and Kreiman 2011; Haggard 2005; Haggard, Newman, and Magno 1999; Kühn and Brass 2009; Soon et al. 2008; Wegner 2003). There are those who object that such activity is merely "cranking up" the brain as a necessary prelude to the complex act of a conscious urge (Baumeister, Masicampo, and Vohs 2011). But this begs the question of just who or what is initiating this preliminary activity, and hence leaves the mind-body problem as starkly unanswered as ever. And suggesting that the unconscious and conscious brain somehow act together gets us no further.

Others would have it that unconscious brain activity holds only for volition, but sensory perception can also be truly unconscious, as in blindsight, where the patient is blind to normal vision yet can still react to a visual motion input with appropriate motor responses (Brogaard 2011; Goodale and Milner 1992). More

cogently, Libet again has shown that neural cortical activity of at least 500 msec duration is necessary before subjects can become aware of a sensory stimulus applied to the skin (Libet et al. 1979). And we know that quite complex decisions can be made entirely unconsciously (Bargh and Chartrand 1999; Dijksterhuis et al. 2006; Persaud, McLeod, and Cowey 2007).

Culture, Language, and the Self

Philosophers recognize two sorts of selves, the bodily self, or "self-as-object," and the first-person self, the "inner I" actively in charge of everything, the "self-as-subject." I suggest that this first-person self-as-subject is not at all actively in charge of volition, attention, and decision-making in the way we so profoundly believe. Instead, culture and language play the major role in development of the self-as-subject and in our illusion that it has primacy of control.

The Emergence of the First-Person Self

We humans have gradually evolved to become highly social beings, well described as "relational selves," now existing and developing within a rich social context (Andersen and Chen 2002; Maclaren 2008). Even before the individual's acquisition of speech, basic bodily communication with caregivers allows each infant to recognize that humans are very different from other animate and inanimate entities. This, together with the infant's ability to imitate using "mirror neurons" and other shared neural circuits, promotes the discovery of a certain "me-like-him-ness" and with that, the development of a self-as-object concept, a process greatly enhanced by members of society referring to their own and their infants' identities as "selves," or some such pre-speech equivalent (Eilan, Marcel, and Burmundez 1995; Iacoboni 2003; Meltzoff and Moore 1995; Uddin et al. 2007).

Once he gets a grasp of language, the child gradually comes to understand that just as he can communicate with other "selves" externally, so too can he now converse, internally and silently, with what he naturally comes to regard as an inner self. Now, I hold that this latter is a mere passive concept. Nonetheless, as the child obtains an increasing comprehension of language and cultural values, there eventually comes a time when society expects him, as a maturing being, to be accountable for his beliefs and actions, as if he indeed possessed an active self-as-subject in charge. As we have seen, however, there is no need to postulate such an active self in control when the brain's higher output is determined by the competitive risk/reward evaluation and emotion-scoring system described. Regardless of this, and given increasing societal pressure, the individual must respond to the challenge, and the child does so in the only way he can—by unwittingly allowing the brain's passive inner self construct to act as if it were the active self-as-subject in control. Again though, because the brain is its own agent, the apparently active nature of the newly deemed self-as-subject

is illusory. There is no inner active self experiencing and driving thought and behaviour, just a passive inner self concept to which the higher brain's communicable output is now referred to make it seem so.

This crucial point bears reiteration: what I am suggesting is that a passive inner self gradually becomes established within the brain essentially as a societal construct. Although it is passive, the social context in which the inner self is formed means that the individual must develop a strong sense of actually having an active inner self at the very core of his or her being, a subjective self that appears to own all thought and experience, an inner "I" in charge. Once that is established, all of the higher brain's communicable output is naturally referred to this self-construct for "ownership," so that the individual comes to have the unshakeable illusion of being a self in control of everything, a state about which it appears impossible to be mistaken, even on deepest introspection (Shoemaker 1968).

CONSCIOUSNESS

The acquisition of society's communication skills (overwhelmingly language) is vital to establishing yet another layer of higher human brain functioning: consciousness. My basic premise is that what comes to the attention of the higher brain comes only after it has competed successfully within the emotion-score evaluation process. Then, provided it can be couched in communicable terms, (again, largely linguistic), it naturally comes to be owned by the individual, who now has the belief that he or she is in control of everything as an active self-as-subject. Then we have the self with consciousness, the first-person subjective self we know so well.

For a human being to achieve her maximum potential awareness of the outside world, she must learn the language communication skills of the cultural group. This gives her a very sophisticated means of processing information to describe and understand the world, instilling, for example, names for various entities, and a grasp of the value of models and metaphors in coming to terms with difficult new concepts (Lakoff 1987; Sellars 1997). Once the first-person self-as-subject entity has been constructed, the individual is in possession of a robust sense of an active inner "I." It then becomes natural for this construct to appear to own all of the higher brain language-based output. And I suggest that when this happens, that output becomes what we call *conscious*ness. It then appears certain to us that we are a true active inner self in charge of the stream of consciousness, the very homunculus watching the television screen.

Consciousness is thus seen as being essentially an emergent feature of the grounding of all language-based higher-brain output in the constructed self-as-subject. It is in reality a state of awareness of the world, but an awareness so heightened over that of non-linguistic creatures that it is deemed here to warrant the separate term, *consciousness*. At whatever level, the more society and the world are experienced and learned over time via communication, linguistic or

otherwise, the more awareness—or, in our case consciousness—each individual attains.

From this perspective, neither consciousness nor the self-as-subject plays any role in the creation of active inner thought. They are entirely secondary and non-causal phenomena resulting from higher-brain activity, the effect and not the cause of the way the world becomes known, of how the individual comes to be "with knowledge," or *con-scious*.

LANGUAGE

The general perspective that consciousness is dependent on language is not new. According to Sellars (1997), "all awareness of sorts, resemblances, facts etc., in short, all awareness of abstract entities—indeed, all awareness even of particulars—is a linguistic affair" (p. 63, original italics). Sellars held that perception is ultimately totally reliant on language to give it meaning. It is as if we start out in life with a non-view of the world, and only learn about it when we come to understand names and concepts given to its various entities or situations by others. Even so, he holds that in our early learning we remain unwilling to say more than "X looks red and triangular," rather than "X is red and triangular," until our statements are endorsed by the reports of more reliable and more linguistically skilled members of the community. The present synthesis is entirely consistent with that. Implicit here also is that self-awareness and introspection are closely related to language as "inner speech" (Werning 2010).

The philosopher Daniel Dennett (1991) also holds that language is essential to consciousness, though the precise nature of the "probe" that samples his ongoing narrative "Multiple Drafts" within the brain to create the conscious state is not at all clear.

FREE WILL

What then of free will? Consciousness as a proposed secondary event in the brain should actually not cause real concern. Our brains are highly sophisticated, avidly learning to encompass all of our knowledge and experience, and embracing all of our emotions, ambitions, wisdom, and concepts, including our beliefs about freedom, ethics, and morality. Our neural network connections are of the greatest intricacy, more than sufficient to the task of solving the myriad complex problems put before them. And it is becoming increasingly clear that a great deal of this brain activity, even in complex decision-making, is carried out at a level below consciousness (Bargh and Chartrand 1999; Beilock et al. 2002; Dijksterhuis et al. 2006; van Gaal et al. 2010). Moreover now, when those pre-conscious options can be seen as vying for higher brain attention through competitive emotion-scoring, there is no longer any need to postulate an underlying self-conscious subject in charge to determine attention. What I am suggesting is that

evaluative and pre-attentive brain processes determine our will, not consciousness. Free will comes entirely from unconscious brain mechanisms, and neither an inner self-as-subject nor consciousness is in control. In effect, the end falsifies the means, and it only seems that a conscious inner self is in charge. It might now even be said, after Voltaire, that "If an active inner conscious self did not exist, the human brain would find it necessary to invent it."

Consciousness, Awareness, and Intentionality

Human consciousness is regarded as a matter of degree. In any individual, the greater the grasp of the language, knowledge, and cultural mores, the higher the level of consciousness. Moreover, though consciousness is not usually attributed to nonhuman creatures, the corollary is that in them, as in pre-speech infants, consciousness or what we might call a lesser "awareness" is also a matter of quantity at any one time, and proportional to the individual's current mastery of the communication skills of the species or cultural group as a whole (through touch, pheromones, utterances, song, bodily gestures, etc.). At a minimum, this must be sufficient to give the individual a capacity for basic social interaction, as well as the development of a rudimentary sense of self-as-subject therefrom (Reddy 2003). Such elementary creature awareness might reasonably be regarded as minimal consciousness, but it is so small in comparison with that attained by linguistically skilled humans that it is here assigned to the separate category, "awareness."

The grounding of the brain's communicable output in the artificially constructed self-as-subject creates a firm a sense of ownership of its contents, and that allows us to grasp the essence of our subjectivity, albeit in a rather strange way. It also provides a means of understanding so-called intentionality, or the way mental phenomena seem necessarily to be "about" or "directed upon" objects, real or imaginary (Brentano 1973; Siewert 2006).

The related term *qualia* refers to the subjective qualities of conscious experiences, or their "feel" to the individual, as in the pain of a headache, the taste of a wine, or the rich redness of an evening sky. Such subjective "raw feels" would seem to imply at least some emotional aspect to the experience. If all higher-brain output realized in consciousness is essentially "emotion-score gated," it would seem natural for conscious mental states to contain that emotional quality as part of their character.

Of course, many would hold that qualia represent more than mere qualitative emotional value, as implied by the associated term "phenomenal consciousness," where the "something it is like" to experience conscious thoughts is generally taken to relate to the ability to access, introspectively, some more fundamental aspect of our mental lives (Tye 2007). The perspective taken here is that this in fact largely reflects our ability to learn to use the sensory organs for the purposes of perception. The congenitally blind when given new sight, and Jackson's

"Mary," no less than the developing child, must all learn to construct their reality from the sensory input in order to perceive, with even simple sensory inputs being initially quite meaningless and entirely without qualia (Jackson 1986; Piaget 1954; Sacks 1995).

Such learning requires a long apprenticeship, including the attainment of sensorimotor skills in interaction with the environment, the ability to combine the various sensory modalities—of color, form, hue, shadow, space, movement—into a meaningful visual whole, and, most of all, the acquisition of language to describe and understand the world (McGann 2010; O'Regan and Noe 2001; Sellars 1997). In short, we must gain experience before we can experience. Bringing experience to consciousness requires the brain to communicate its grasp of the percept to the first-person self-as-subject construct, so providing it with a firm sense of ownership. The "me-ness," or "what it is like for me" of phenomenal consciousness, is precisely what one expect from that process.

Conclusion

We differ from computers in two important respects: in having a biological drive for survival, and in having a highly developed mechanism for inter-subjective discourse within society. These functions are subserved by the emotional brain's risk/reward evaluation system, and by language communication, respectively. The former determines what comes to final attention and cognition, while the latter confers on the individual a high order of knowledge and awareness of the world, as well as a strong sense of self. Passive as this self entity actually is, it comes to be regarded by the individual in society as the essence of his or her active inner self-as-subject, which thereby comes to own all of the brain's language-based content. The individual is then a self with knowledge, and what we call consciousness is secondary to that.

The hypothesis outlined here is not meant to provide a comparison with the many theories of consciousness, except where relevant. Suffice it to say that no theory—whether based on the neural correlates of consciousness, information processing, intentionality, phenomenology, higher-order representation, theoretical modeling, neural workspace models, sensorimotor contingency theories, introspection of "lived experience," "embodied cognition," or other views—is yet sufficient (Baars 1988; Chalmers 1995; Crick and Koch 2003; Damasio 1999; De Preester 2007; Degenaar and Keijzer 2009; Dehaene and Naccache 2001; Droege 2005; Edelman and Tononi 2000; Ingram 2002; Legrand 2007; O' Regan et al. 2001; Petit 2007; Petitmengin 2009; Siewert 2006; Thagard and Aubie 2008; Thompson 2011; Tononi 2008; Tye 2007; Zahavi 2007). As Tsuchiya and Adolphs (2007) remark: "Future work requires not only more data but also further theoretical development of concepts . . ." (p. 158). It is to this latter end, and from a fairly broad perspective (Boyd 2012), that the present manuscript is addressed.

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